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Method for the production of substrate masses for the cultivation of plants

Description

The invention relates to a method for the production of substrate masses for the cultivation of plants.

As substrate masses for the cultivation of plants, i.e. substrate masses for the cultivation, the sale and shipping of seedlings and cuttings, use is made among other things, of moulded products made from glass wool or rock wool. Up till now, this method has not been successful, mainly because of psychological reservations on the part of customers to buy pot plants in rock wool or glass wool.

Another possibility of making substrate masses available for the cultivation of plants is to fill potting soil into a tube made of thermoplastic fibre material, shrinking the tube by means of heating around the potting soil and to plant the seeds or the cuttings or seedlings into the thus consolidated potting soil. This method is, however, much too expensive and cost-intensive for the industrial manufacture of moulds made of potting soil.

Experiments of admixing thermoplastic fibre such as, for example, polypropylene, to the potting soil and subsequently heating the mixture in order to consolidate the same to produce moulded products have so far been unsuccessful. Owing to the poor heat conduction caused by the air inclusions in the loosely packed potting soil, a uniform heating of the mass is not possible, so that when the softening temperature of the thermoplasts inside the pack has been reached, the decomposition temperature of the thermoplast has already been surpassed in the outer areas.

It is the object of the invention therefore, to provide an economical method for the industrial manufacture of moulded products made from substrate materials for the culti-

vation of plants, admixing a fibrous thermoplast that does not exhibit the above-mentioned drawbacks.

Subject of the invention is a method for the manufacture of substrate masses for the cultivation of plants, characterised in that 5 to 60% by weight, preferably 5 to 15% by weight, related to the total weight of the mixture of a thermoplastic microwave-weldable fibre material is admixed to the substrate material, and the mass is welded together by means of microwave irradiation at 2400 to 2500 MHz and at 600 to 6000 watts at a temperature ranging from 60 °C to 150 °C and the exposure to radiation lasting from 20 sec to 120 sec.

As substrate material, rock wool or glass wool, preferably potting soil may be used. Mixing the substrate material with the thermoplastic fibre material may take place in the usual manner, for example, with the aid of mechanical mixers. The amount of thermoplastic fibre in the substrate/fibre mixture is, in relation to the total weight of the mixture, approximately 5 to 60% by weight, preferably approximately 5 to 15% by weight of fibre material.

As fibre material microwave-weldable, i.e. high-frequency radiation-responsive thermoplastic fibres are suitable. High-frequency-responsive thermoplasts are polymers, whose monomeric elements possess an intramolecular dipole moment so as to be excitable to molecular oscillation in the microwave range, resulting in the polymers being heated. Examples of this are the fibrous homo- and copolymerisate of the vinylchloride, preferably vinylchloride/vinylacetate copolymerisate. The length of the fibre may range from between 2 to 100, preferably 2 to 20 mm; the thickness is between 2.0 and 8.0 dtex. The fibre material should be rot-resistant, that is to say waterproof, weatherproof, such as light- and heat-resistant.

To shape and cure the substrate/fibre mixture, the mass is filled into moulds, for example, polystyrol moulds. The mixture is irradiated in a range from 2400 to 2500 MHz and at 600 to 6000 watts. Microwave radiation may take place with usual, commercially available appliances. The temperature range lies between 60 °C and 150 °C and the duration of radiation lies between 20 sec and 120 sec.

After the mixture of substrate material and thermoplastic fibre has been cured by means of microwaves, an adequately bonded, moulded product is obtained. Curing by means of microwaves keeps the substrate mass breathable and loose. In addition, curing by microwave radiation sterilises or pasteurises the potting soil, acting as preventive measure against mildew or fungus. After curing and cooling the moulded product, seeds or cuttings are planted, optionally mechanically.

Exemplary embodiment

450 grams of potting soil are intimately mixed with 50 grams of a copolymerisate comprised of 85% by weight of vinylchloride and 15% by weight of vinylacetate having a fibre length of 10 mm and a fibre thickness of 3.3 dtex and filled into truncated polystyrol moulded product, having a volume of 125 cm^3. The potting soil/fibre mixture is irradiated for 30 sec at 80 °C with high-frequency radiation in the range from 2400 to 2500 MHz at 600 watts. After removing the moulds, one obtains potting soil moulds that are adequately bonded and keep their shape.

CLAIMS

1. A method for the production of substrate masses for the cultivation of plants, **characterised** in that 5 to 60% by weight, preferably 5 to 15% by weight, related to the total weight of the mixture of a thermoplastic microwave-weldable fibre material is admixed to the substrate material, and the mass is welded together by means of microwave irradiation at 2400 to 2500 MHz and at 600 to 6000 watts at a temperature ranging from 60 °C to 150 °C and the exposure to radiation lasting from 20 sec to 120 sec.

2. A method for the production according to claim 1, **characterised** in that as thermoplastic microwave-weldable fibre material a vinylchloride/vinylacetate copolymerisate having a fibre length from 2 to 100 mm and a fibre thickness from 2.0 and 8.0 dtex.

3. A method for the production according to claim 1, **characterised** in that as substrate potting soil is used.

ABSTRACT

The invention relates to a method for the production of substrate masses for the cultivation of plants by means of mixing substrate material, preferably potting soil with thermoplastic, microwave-weldable fibre material and moulding or curing the mixture by means of high-frequency radiation.